

Avian conflicts

P. L. Schwagmeyer

Dunnoch Behaviour and Social Evolution. By N. B. Davies. *Oxford University Press*: 1992. Pp. 272. £35, \$70 (hbk); £13.50, \$28 (pbk).

MUCH of behavioural ecology focuses on how individuals optimize their reproductive success under constraints imposed by phylogeny and the environment, the latter including resources, predators, parasites and members of the same species. Conspecifics may assume the role of ally, foe or a bit of both. That these roles ultimately depend on genetic interests is illustrated beautifully by Davies' studies of dunnoch reproductive behaviour.

Although bland in appearance, dunnochs defy even sixties' norms of sexual behaviour. While they often practice 'conventional' avian monogamy, they also sometimes form trios (two unrelated males plus a female or vice versa), and sometimes neighbouring females are jointly defended by two or more males. Contrary to traditional views of how avian mating associations form, Davies argues that dunnoch females essentially ignore males while establishing their breeding territories, and males then compete to defend resident females (that is, like typical mammals). Which mating system occurs depends on how easily female territories can be monopolized by males: the larger a female's territory, the more likely she is to have two or more males try to defend her.

The shared defence of a mate creates plenty of conflicts of interest. Although two males who simultaneously attempt to defend a female eventually reach a dominance-based truce, the onset of breeding renews bickering. And with apparent good reason, for if dominant males mateguard effectively, they can sire all the offspring, but if they lapse, their share declines. DNA fingerprinting reveals that a male's paternity is related to the relative time he gains sexual access to a 'shared' female; on average, the dominant male sires about 55 per cent of the brood.

Genetic fingerprinting also shows that each male's participation in feeding the young hinges on gaining sexual access to the female. And therein lies a key insight for understanding why females actively resist being monopolized while fertile: a female that mates with both the dominant and subordinate males acquires the assistance of both in rearing her offspring, while avoiding sabotage of the clutch by the subordinate male. Davies shows that females in polyandrous trios more than double their production of fledged young if they mate

with both males, providing one of the best-documented advantages to vertebrate females of mating with several different males.

The divergence of male and female mating interests and the ups and downs of male-male interactions are just two of several conflicts of interest discussed by Davies. Among the others are conflicts over parental effort and the adversarial relationship between dunnochs and cuckoos. The organization and integration of these topics makes the book useful even to those familiar with his work. It should be particularly instructive for students, because the work addresses questions typical of the general field of behavioural ecology and demonstrates the value of combining experiment and description. And all from the study of mousey little birds breeding a short bicycle ride from Davies' office. □

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Joint account

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All About Arthritis: Past, Present, Future. By Derrick Brewerton. *Harvard University Press*: 1992. Pp. 317. \$29.95, £15.95.

DERRICK Brewerton, until recently a professor of rheumatology at the University of London, has written an account for the general reader about the nature and causes of arthritis, and the historic search for a cure. The diversity of rheumatic conditions does not make this an easy task, and his narrative is invariably fragmented. Nonetheless, he skilfully guides us through the complexities of bacteria, viruses and host defence; the nervous system; the structure and function of joints; the mosaic of factors (hormonal, genetic and environmental) involved in arthritis; and the prospects for new forms of therapy. He is particularly elegant when dealing with the complex (and controversial) influence of personality and emotion, perhaps best illustrated by the current epidemic of patients diagnosed as having fibromyalgia and myalgic encephalomyelitis. Throughout, the author goes to great lengths to emphasize the global nature of arthritis.

One of the book's main strengths lies in the lucid interweaving of historical vignettes on the founding fathers (and occasionally mothers) of rheumatology and inflammation. Some, such as Gregor Mendel, Louis Pasteur, Robert Koch and Paul Ehrlich, are well known; but

equally stimulating tales about lesser-known individuals abound, such as John Lawrence, who set out in the north of England with a mobile unit complete with clinical laboratory and X-ray facilities to blaze a trail for the epidemiology of rheumatology, and Pamela Bjorkman, who dedicated eight years to determining the structure of the antigen HLA-A2. Brewerton also clearly enjoys retelling stories of those scientists whose important contributions were little appreciated or even ridiculed in their own lifetime, such as Rosalind Franklin (whose X-ray crystallographic work established virus structure) and Martinus Beijerinck (who established the modern concept of viruses). Even Jean-Martin Charcot was much derided for his suggestion that "nerves might nourish the bones and joints so that, in disease, joint failure [is] due to a lack of a trophic factor". But today the French neurologist deserves recognition as the first person to speculate about the existence of neuropeptides.

Although the book is often sparkling reading, the bobbing and weaving between clinical descriptions and basic science is likely to irritate. And despite the useful glossary of terms, I suspect that the author has overestimated the basic knowledge of his intended audience. There are also some surprising omissions. In the discussion of the causes of systemic sclerosis, the terrible story of the link between this disease and contaminated cooking oil in Spain surely merits more than a mention. And there is nothing about diet as a cause of arthritis. Although this area is notorious for some dubious claims, good work (for example, implicating dietary fat in lupus development) has been published and deserves wider recognition.

It is odd, especially given the author's close interest in the subject, that he ignores the long controversy about whether *Klebsiella* infection is involved in the development of ankylosing spondylitis. More recently, Alan Ebringer, who first suggested the link, has put forward the even more controversial suggestion that *Proteus* infection might be important in rheumatoid arthritis, although others now argue strongly that a slow-growing form of mycobacterium is involved. Here I would have liked Brewerton's views — after all, as Ehrlich was apparently fond of remarking, "what matters in research is not the initial discovery but what one thinks and does next". These deficiencies, however, do little to detract from the many gems in this generally well polished book. □

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